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ABSTRACT

The 30 or more major educational reform reports that have appeared since "A Nation at Risk" are in solid agreement that public education falls short of excellence. While suggestions for reform in elementary/secondary education have focused on teaching, in colleges and universities the emphasis has been more on curriculum than instruction. However, achieving excellence in postsecondary education requires an understanding of what teachers can do to cause learning. Major findings from research on teacher effectiveness can be distilled into three conclusions: (1) when students are actively involved in the learning task they learn more than when they are passive recipients of instruction; (2) students generally learn what they practice; therefore, time engaged in learning should be related to desired instructional outcomes; and (3) if teachers set high but attainable goals, academic performance usually rises to meet expectations. Though years of research confirm that these factors are significant to student learning, researchers consistently find that such common sense practices do not exist in college classrooms. Many educators feel that assessment is the route to attaining quality in undergraduate education; however, in most states the necessary links between assessment and instruction have yet to be forged. Several methods for improving these links have been proposed, including classroom research, whereby teachers evaluate the effectiveness of their own teaching; the use of a Teaching Goals Inventory to help teachers determine whether their instructional practices are accomplishing their instructional goals; and the development of various feedback devices to be used throughout the term to determine whether students are learning what instructors are trying to teach. (LAL)

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TEACHING FOR LEARNING

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TEACHING FOR LEARNING

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It has been almost four years since A Nation at Risk united growing dissatisfaction with education in America into an educational reform movement. The thirty or more major reform reports that have appeared since are in solid agreement that education in the public schools and in colleges and universities falls short of "excellence."

Suggestions for reform in higher education have much in common with those for elementary/secondary education, but there are also some interesting differences. Reform in the public schools seems to center around the quality of teaching (how to attract and train better teachers), and the quality of the workplace (how to make the environment more conducive to good teaching.) Conversations about the improvement of schooling are likely to include issues of merit pay, master teachers, and the Holmes Group and Carnegie Forum proposals for teacher training.

In colleges and universities, the emphasis is more on curriculum than instruction. Some people, most notably the Secretary of Education, think that students are not learning what they should be learning in college. Secretary Bennett, for example, advocates a return to the "task of transmitting a culture to its rightful heirs," and the Association of

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American Colleges entitled their call for reform "Integrity in the College Curriculum." While a few higher education reports have called for more attention to teaching, generally speaking, reformers in higher education have been more willing to tackle the reform of what is taught than how it is taught.

What schools and colleges have in common in the 1980's reforms is that in both cases, the reports look beyond the classroom teacher for action. The advocates of reform in the secondary schools think that the responsibility for improvement lies with those who train, select, and supervise teachers. In higher education as well, there is some reluctance to place the responsibility for educational reform in the hands of individual faculty members. Instead, curriculum committees and the collective faculty are urged to take action to increase requirements and raise standards. So far, there has been little discussion in either secondary or postsecondary education about what individual teachers should be doing to improve learning in their own classrooms. While Governors, blue-ribbon commissions, and educational agencies are all issuing reports and wondering out loud what they should be doing to improve student learning, classroom teachers wait to see what happens.

We in higher education have been especially reluctant to enter the classroom for a number of reasons. In the first place, we equate academic freedom with the sanctity of the classroom, and there is a tradition of restraint in probing too deeply what goes on there. Secondly, college teachers are authorities in their disciplines. No one else at the institution knows quite as much as they do about their

particular specialities, so there is an understandable reluctance to tell faculty what or how to teach. And finally, there are some age-old questions that have not been answered to the satisfaction of many. What constitutes effective teaching? Who should evaluate teachers, and how? Can good teaching be recognized and rewarded?

Actually, we have developed some pretty good answers to those questions over the past decade or so, but our attention to educational quality in this decade seems to be focussed more on student assessment than on teacher evaluation. One would think that the two should go together, but there is a strange reluctance to wed teaching and learning. We talk easily of teaching and learning, but we are quite uncomfortable talking about teaching for learning. Why can't we bring ourselves to ask what teachers can do to cause learning?

In part, it is because much of the past research has consisted of correlational studies which tell us what goes together, but not why. As every graduate student is warned, correlation does not mean causation. We have many studies, for example, describing the characteristics of successful teachers and relatively few of teacher behaviors in the classroom. In general, the correlation between teacher characteristics and student learning is modest, hovering in the .20s (Bloom, 1980). There is no good reason, of course, for thinking that the characteristics that are easy to measure and therefore popular in research studies, such as age, degrees, or number of publications should be related to student learning, but even if we were to find highly significant correlations, most teacher

characteristics are quite resistant to change. There is nothing educators can do, for example, to change age, gender, or years of experience. Ben Bloom (1980) calls these "unalterable variables," and he urges researchers to gain more insight into "alterable variables"--variables that can be changed by educators.

I think we need to begin to talk boldly about teaching for learning, i.e. about what teachers can do to cause learning. From research conducted over the past several decades, we know some useful things about how to promote student learning. The group of educational researchers who wrote the NIE report entitled Involvement in Learning (1984) boiled the implications for higher educators down to three imperatives: 1. Teachers must get students actively involved in learning. 2. We must hold high expectations for student performance, and 3. Students must be given adequate assessment and feedback.

There is nothing very startling about those conclusions. Perhaps it is because they are so close to common sense and the experience of teachers that we fail to consider their importance. Somehow research findings that defy common sense get a lot more attention than those that confirm it. When the Coleman Report suggested that good schools and teachers couldn't be distinguished from poor on measures of student learning, the implications were widely debated--although in retrospect, it appears that the findings were more a commentary on the state of research than on the state of education. It is harder to gain attention for well-established research findings that make a lot of sense, but are frequently ignored in schools and colleges. I have distilled the major findings from research

on teacher effectiveness into three conclusions that can be stated as follows:

1. When students are actively involved in the learning task, they learn more than when they are passive recipients of instruction. Nothing very surprising in that. But research shows that classrooms vary enormously in the way time is used. In some classrooms, students are actively engaged in learning 90 percent of the time; in others, they may be involved only 30 percent of the time. Researchers on schooling are likely to refer to this as "time on task" or "engaged time," whereas those in higher education are likely to call it student "involvement." Clearly, some teaching methods are more likely to engage students than others. After hundreds of studies comparing lectures with discussions, for example, we find the discussion method somewhat superior to lecture in experiments involving retention, transfer of information to new situations, problem solving, thinking, attitude change, and motivation for further learning (McKeachie, et.al.,1986) But the differences are not large--probably because student engagement is a more important variable than method of instruction. An excellent lecture may get excellent involvement, while a poor one may get none. A lively discussion may engage everyone--a wandering one, very few. The involvement demanded by teaching methods such as PSI, Mastery Learning, case study, and interactive computer programs is likely to be quite high, but involvement alone will not result in productive growth. That leads to a second major research conclusion.

2. Students generally learn what they practice. If they practice making errors in skills courses or sloppy thinking in

discussion, then that is what they learn. If teachers ask questions in class or on tests, calling for little more than memorization of facts, then that is what students will learn. If there is no feedback on performance, students can go an entire semester without much indication of whether their learning is productive, nonproductive, or counterproductive.

A relatively new research variable, labeled "academic learning time" or ALT, is defined as time engaged in learning related to desired outcomes, during which a student experiences a high success rate (Berliner, 1984). The message here is quite consistent with the recommendations in the NIE report for higher education. We can state it rather simply: students need to be actively and successfully involved in learning tasks that lead to desired outcomes. Nothing at all surprising about that. What is surprising, perhaps, is how frequently research demonstrates that Academic Learning Time shows enormous variation from teacher to teacher.

I have not been able to locate studies at the postsecondary level that have attempted to measure Academic Learning Time, but professors could make a rough gauge of their own use of ALT by asking themselves two questions. The first is, how closely related are the learning tasks I assign to the learning outcomes I desire? If a desired outcome is independent thinking, and the learning tasks are informational reading assignments and note-taking during lectures, then the ALT will be quite low.

The second question is, how closely related are the test questions I use to the outcomes I desire? The most effective route to revealing expectations to students is through tests and

grades. Although most of us would like to think that college students are mature enough to value intrinsic motives for learning, there is no ambiguity in the research that shows students learn what they expect to be tested on. McKeachie and his colleagues (1986, p. 124) conclude from their review of the research that, " Tests provide an operational definition of goals that is very compelling for the students." If a desired learning outcome is the ability to communicate clearly, and the test consists of multiple-choice and true/false questions, then students are not likely to practice successfully what the teacher wants them to learn, and ALT will once again be quite low.

Academic Learning Time is simple in conceptualization, complex in measurement, and critically important in student learning. Most important, it is an "alterable variable" that teachers can do something about.

3. The third cluster of research findings on teaching effectiveness can be stated this way: If teachers set high but attainable goals, academic performance usually rises to meet expectations. This has been labeled the "Pygmalion effect," and there is considerable evidence of its operation in both secondary and postsecondary education. Richardson and his colleagues (1983) found, in their observation of community college classrooms, that there is often an unspoken agreement between teacher and students that neither will make very heavy demands on the other. Thus teachers don't work very hard at teaching, and students don't work very hard at learning. It is a reasonable guess that neither shows much growth or improvement. Miami-Dade Community College found that when they raised expectations, in a

move that some criticized as racist, student performance rose to meet the new standards (McCabe, n.d.).

There is no argument in the research community that these conclusions drawn from years of research are significant factors in student learning--nor, I suspect, does any teacher question their relevance. Yet researchers consistently find that such common sense practices do not exist in many college classrooms. The authors of the NIE Report applied the label of "three critical conditions of excellence," to such basic research findings and stated that "undergraduate education could be significantly improved" if we applied them in our classrooms and on our campuses. (NIE, 1984)

A quote from Nate Gage, a professor at Stanford and a major scholar of research on teaching effectiveness, provides a very appropriate summary of what I have tried to say about teaching for learning. He writes:

> We are beginning to have evidence that...changing teaching practices causes desirable changes in student achievement, attitude, and conduct. And the changes in achievement are substantial, not trivial. Moreover, the changes are brought about not by revolutions in teaching practice or school organization but by relatively straightforward attempts to educate more teachers to do what the more effective teachers have already been observed to be doing. (Gage, 1984, p.91)

Now I want to turn from research findings to assessment proposals. We in higher education are putting a lot of faith in assessment as the route to attaining quality in undergraduate education. According to a recent Campus Trends report issued by the American Council on Education (El-Khawas, 1986) three-fourths of all college administrators think that assessment is a good idea whose time has come. More interesting, however, is the

finding that even more college administrators (91 percent) think that assessment should be linked to instructional improvement. Most authorities on assessment agree. Turnbull (1985, p. 25) observes that "the overriding purpose of gathering data is to provide a basis for improving instruction, rather than keeping score or allocating blame." And the report issued by the Education Commission of the States (1986, p.32) asserts that "Assessment should not be an end in itself. Rather it should be an integral part of an institution's strategy to improve teaching and learning...."

But in most colleges and in most states, we have yet to forge the necessary links between assessment and instruction. So far, classrooms continue to be regarded as the mystery boxes of education. What we really want to know is, What are students learning in classrooms and laboratories and anyplace else we are consciously striving to teach them? Yet what we are proposing to do is to bypass the classroom and go directly to assessment--usually large scale assessments taking place at the institutional or statewide level.

Most people, I think, assume that assessment will improve instruction by documenting the strengths and weaknesses of student performance. Teachers will then use the results of the institutional assessment to take appropriate action. In higher education, however, "taking appropriate action" usually means making collective decisions about <u>what</u> is taught, i.e. about the curriculum. It rarely means doing anything about <u>how</u> it is taught. But <u>how</u> students are taught lies at the heart of quality education. It makes the difference between a lifelong learner

and a grade grubber, between enthusiasm for learning and indifference to it, between an educated society and a credentialed one.

Ideally, a college is a community working in harmony toward common ends. Practically, it is a collection of individuals with maximum freedom to do their own thing, hopefully as well as they know how. The problem is that many college teachers really don't know how to teach very well. Typically, they have no training for teaching, and they have no one to talk with about it.

Unfortunately, assessment as currently conceived, isn't going to tell teachers much about what students are learning in their classrooms, and therefore, it is not going to be very helpful to teachers. Since our classroom-based system of education is organized and funded on the assumption that something important happens when teachers meet students in the classroom, teachers are going to have to get better information from assessment if we expect to improve the quality of undergraduate education.

A few colleges, such as Alverno, with extensive experience and heavy faculty involvement in assessment, have managed to make a profound impact on teaching. But most colleges, I predict, will conduct their assessment, add a few more course requirements, tighten academic standards, and see that students toe the line. Despite all of the current enthusiasm for assessment, it looks as though it will stop short of the classroom door, doing little to improve the quality of learning in the average classroom--which is, after all, where the most of the learning that we are held accountable for takes place.

It is for this reason that I have proposed the development of a new set of skills and tools for college teachers that I call "Classroom Research." (Cross,1986). The purpose of Classroom Research is to help teachers evaluate the effectiveness of their own teaching. The challenge is to help teachers clarify what they are trying to do, and then to help them develop measures that will show them whether they are accomplishing their teaching goals.

The problem with earlier efforts to get teachers to state teaching objectives was that goals became the servant of measurement rather than vice versa. Behavioral objectives became downright silly because the task was to state, as a teaching objective, whatever we could measure. It serves no useful purpose to lower our educational aspirations because we cannot yet measure what we think it is important to teach. Quite the contrary, measurement and assessment will have to rise to the challenge of our educational aspirations. I am not confident that is the case in most of the current plans for assessment.

Within higher education, we seem to have developed some shared goals that we think are important. There is an extensive literature on goals, most of it from scholars, commissions, and task forces, rather than from teachers. From this literature, Howard Bowen (1977) has developed a wonderful catalogue of widely-accepted goals for the education of individual college students. He includes all of those attributes that we know so well, starting with Cognitive Learning, which includes the development of competencies such as verbal and quantitative skills, substantive knowledge, rationality, and intellectual

tolerance and integrity. He then reminds us of our goals for Emotional and Moral Development, including self-discovery, psychological well-being, human understanding, values and morals, etc. And finally, he lists under Practical Competence such goals as leadership, citizenship, economic productivity, sound family life, fruitful leisure, and consumer efficiency.

If those are the goals, it seems fair to ask what we do to assure that they are being addressed. Are college teachers concerned about the worthy use of leisure time? What do they do to aid in self-discovery or psychological well-being? What about intellectual integrity? Do we teach that? Do we know how? If we don't teach it, do we still think it is an important goal? I suspect that large numbers of teachers subscribe to the goals that appear in the literature as important outcomes of a college education. But how are they accomplished?

Research on what happens to students in college is quite positive, suggesting that, in fact, we can legitimately claim that some of our noblest goals do in fact seem to get picked up and carried away by students as they leave our colleges. Tolerance, for example, seems to be an outcome of college, and we suspect that it is caught rather than taught. In fact much of the student development that occurs in college seems to be more the result of faith and accident than of anything we consciously teach or attempt to control. We are extremely fond, for example, of quoting Woodrow Wilson, who said when he was president of Princeton, that "The real intellectual life of a body of undergraduates, if there be any, manifests itself not in the classroom, but in what they do and talk of and set before

themselves as their favorite objects between classes and lectures." (quoted in Trow, 1975, p. 270).

While that may well have been true in the small residential colleges that existed 70 years ago, and is probably still true on perhaps 10 percent of college campuses, it comes dangerously close to admitting that we as educators can't do much to improve undergraduate education anywhere, and certainly not on the commuter campuses where many students rush from parking lot or subway station to class without ever speaking to another student, let alone pondering the state of the universe or their place in it.

While I suspect that there is universal agreement that a college education must be more than the sum of its parts, the reality is that as the commuting, part-time student population increases, campuses get more comprehensive and more impersonal, on-campus extracurricular activities are replaced by part-time jobs, family responsibilities and day-to-day struggles to survive, what students learn in college will be more and more dependent on what they learn in classrooms. Unless we can improve what goes on there, we have little chance of improving undergraduate education.

Leaving aside for a moment the high flown rhetoric about the goals of higher education, let us ask the smaller but more useful question. What <u>are</u> teachers trying to do? Ironically, that is one of the most underresearched questions in higher education. We rarely ask teachers what they hope that students will learn from them. There is a list of 16 various and assorted teaching goals that has been used from time to time, albeit more to study

faculty attitudes than to study teaching. In a massive national study conducted in 1973 in which the sturdy 16 items were embedded in a hundred others concerning faculty characteristics, Alan Bayer found that 97 percent of the teachers in community colleges, four-year colleges, and universities thought that developing students' abilities to think clearly was "essential" or "very important" in their teaching of undergraduates. Almost as many thought that mastery of knowledge in a discipline and increasing the desire and ability to undertake self-directed learning were important (92 percent and 89 percent, respectively). It would be interesting to know just what teachers did in their classrooms to prepare students for self-directed learning, or how the 47 percent subscribing to the development of moral character or the 57 percent endorsing the achievement of deeper levels of students' self understanding went about implementing those goals.

I think it is time to take teachers and their task of teaching undergraduates seriously. To that end, I am developing a Teaching Goals Inventory*. It asks teachers what they are trying to accomplish in one designated class. Next I am going to want to know what teachers <u>do</u> to accomplish their goals and whether those steps are successful. Far more important than what the Teaching Goals Inventory tells <u>me</u>, however, is what it tells teachers. I hope that it will help teachers clarify their teaching goals and raise some intellectual curiosity about whether they are accomplishing those goals.

*Appreciation is expressed to Elizabeth Fideler and _____, graduate students at the Harvard Graduate School of Education have served as research assistants in the project.

That leads rather directly to the next step in this project on college teaching, which is to discover or devise a set of assessment measures that will tell teachers whether students are learning what teachers say they are trying to teach. That will take the form of a set of feedback devices indexed to teaching goals.** Feedback devices are tools that tell teachers what students are learning. They can be simple or complex, well-researched or experimental, traditional or nontraditional. If, for example, a teacher states that mastery of subject matter is an essential goal of his or her teaching, then the traditional classroom test is a fairly good feedback device. Almost every teacher is interested in content learning to some extent, and we know a fair amount about how to construct tests that are reliable and valid. When I say "we" I mean the profession of education. Most college teachers know almost nothing about the construction of classroom tests. They use very primitive measures because they have never been exposed to existing knowledge about how to construct a test that will provide maximum information about what students are learning. Tests are frequently used simply to sort and grade students.

The other problem with classroom tests is that they are frequently <u>final</u> exams, and feedback comes too late to improve teaching for that class. Some teachers, however, have devised simple and effective ways to find out what they need to know about student learning <u>during</u> the semester. A physics professor

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at the University of California uses the extremely simple device of "minute papers" to obtain student feedback on classroom learning. He stops class one minute early four or five times during the term and asks students to write the answers to two questions: 1) What is the most significant thing you learned today? and 2) What question is uppermost in your mind at the end of this class session? He reports that this simple device gives him excellent feedback on whether students are understanding and whether there are important questions to which he should respond (Wilson, 1986, p. 199).

When I described "minute papers" at the Harvard Assessment Seminar recently, Fred Mosteller, a distinguished statistician and holder of an endowed chair at Harvard, became intrigued and involved his undergraduate class in Stat 100 in providing feedback on his lectures. After some experimentation, he came up with a modification of minute papers. He now asks students to answer one question at the end of his lectures: "What was the muddiest point in the lecture?" Sometimes, he prepares handouts for the next class period to clarify a point or he may try a different approach next time.

The point is that here is the simplest of all possible feedback devices sparking interest, experimentation, faculty conversation, and student involvement in the improvement of instruction.

Another feedback device that has become very common on campuses over the past decade is student evaluation of teachers and courses. In two-thirds of the four-year liberal arts colleges, academic deans claim that systematic student ratings of

instruction are "always used" in the evaluation of faculty (Seldin, 1984). Yet teachers claim that they do not find student ratings, collected for purposes of evaluation, especially helpful in improving teaching. That's too bad.

Students are a rich and virtually untapped resource for the improvement of teaching. Research is now reasonably clear that college students are generally reliable and unbiased judges who tend to give the highest ratings to those from whom they learn the most (Gaff and Wilson, 1971; Centra, 1977; Cohen, 1982; Gleason, 1986). No research or evaluation project or faculty development program could possibly hire classroom observers with sixteen years of experience observing teachers day in and day out on good days and on bad with such a good opportunity to judge the impact of teaching on learning. That makes it sad that we don't use students to help teachers as well as to evaluate them, and doubly sad that we don't train students to be careful observers of their own learning. Designing student feedback forms that are collected by the classroom teacher midway through the semester rather than at the end and that offer constructive reactions to teaching would help students be better consumers of education as well as help teachers be better providers of it. Ultimately, of course, all of our information about student learning comes from students, in the form of outcome measures, or value added, or self reports on reactions to teaching.

Classroom research on teaching and learning may be done privately and individually, but sometimes teachers working together in academic departments provide a rich resource for gathering indicators of some learning outcomes. Most departments

are interested in stimulating student interest in their field of endeavor. It is fairly easy to collect information about how many students elect advanced courses in the department and how many of those possess the cognitive entry skills required for more advanced work. It also makes sense to ask college students whether and how courses stimulate further interest and when and on what basis students make their decisions to pursue a major in the field. This is more than enlightened self-interest. As McKeachie and his fellow reviewers of research on college teaching noted, "A course that dulls the students' curiosity and interest must be a failure no matter how solid the content" (1986, p.1).

Other measures of student learning are more difficult. Some people have spent entire careers trying to measure creativity or critical thinking or ethical behavior. It is a truism that we know the least about measuring the things that are most important to us as educators. I don't think that means that we wait until the "experts" have devised the appropriate measures. On the contrary, our lack of definitive knowledge suggests that the experts need all the help they can get. Many college teachers are bright, creative people, with high motivation for devising measures of student learning outcomes. Moreover, there is increasing evidence that some academic skills are best studied in the context of subject matter content.

At the same time, teachers do not need to reinvent the wheel. We have developed some measures of complex learning outcomes that appear useful. Teachers should know of the existence of these measures, and be encouraged to experiment with them. It may be

that their experience with them will contribute to the improvement of the measures.

I have tried to give some fairly simple and concrete examples of types of feedback that will tell teachers what students are learning. Teachers will be able to think of many more relevant to their field and style of teaching. My hope is that through classroom research teachers will become more sensitive to student learning, more involved with experimentation and improvement in teaching, and better informed about what they can do in the classroom to improve the quality of undergraduate education.

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